How the First Bird Learned to Fly

Was It by Jumping Up or by Volplaning From Trees?

Here is a drawing of the probable appearance of the first flying creature. The form is arrived at by scientific deduction and study of the birds of today.

It is safe to say that since the first bird was evolved from a reptile about 7,000,000 years have passed. As an existing type, it has vanished.

BY GARRETT P. SERVISS.

PERHAPS the most wonderful story that the geological strata have yielded concerning the development of life on this globe is that of the emergence of the line of the birds from that of the reptiles. The water was, apparently, the first home of animals, the land was the second, and finally came the atmosphere. To acquire the kingdom of the air the power of flight was necessary. Either the birds had to be created as an entirely new form of animal or they had to be developed out of a preexisting form. The latter method was adopted, and the anatomy of the reptiles lent itself to the change.

But by what steps was flight acquired? There are two principal theories: one, that flight was brought about by jumping down; the other, that it came through jumping up. The first suggestion seems the more reasonable and probable, besides being in accord with the habits of certain tree climbing animals of today, which have developed partial powers of flight, such as soaring and sliding.

Mr. Beebe, of the New York zoological park, has discovered new evidence that flight began by sailing down from an elevation and not by jumping up from a lower level to reach something above. He has found that in several species of birds, the white-winged dove, for instance, the newly hatched young possess rows of sprouting quills on the outer legs, running from below the knee nearly to the tail. If these were developed they would form winglets, and would aid the spread tail in supporting the body after it was launched in the air, acting somewhat like airplanes.

But these rudimental winglets do not develop in the modern bird. They are simply relics of a former state of things, anatomical memories, so to speak, perpetuating themselves in the embryo, but disappearing in the adult because their usefulness has passed.

A guess is even made at the length of time that has elapsed since the first birds were developed out of reptiles by acquiring feathers on the fore and hind limbs, which enabled them to glide easily to the ground from perches in the trees, like the flying lemurs, or the flying squirrels of our time. It was, Mr. Beebe thinks, something like seven million years ago, in the early Jurassic age, that this interesting advance in animal locomotion occurred. The earliest bird like creature known is the archaeopteryx, a feather limbed reptile.

The order of development seems to have been from sailing, or gliding, flight to true wing flight, and this involved the gradual disuse and disappearance of the hinder wings, or "pelvic" wings, and the growth and improvement of the fore wings, until they became the only ones. The superiority of the fore wings consisted in the fact that they could be used as active aids in sustaining the body in the air by flapping, while the hind wings were available only as gliders, and they became unnecessary after the fuller development of the tail.

As to the origin of feathers, they, too, were not created as entirely new things, but were evidently developed by gradual evolution, under the spur of use and necessity, from the scales of the reptile. Back of the archaeopteryx was, Mr. Beebe believes, an earlier type of flying reptile, which, he calls the tetrapteryx, or four winged flyer. This has vanished as an existing type, but the image of it reappears, like a flitting vision of the far past, in the rudimentary structure of the young squab.

High Among the Clouds

By Garrett P. Serviss.

PEOPLE who climb lofty mountains often get wonderful views of cloudland, but the best views of that kind are obtained from balloons. An example of the spectacle that is sometimes spread beneath the eyes of an aeronaut is shown in the accompanying photograph. The sense of loneliness and of being lost in space almost overwhelms the mind when the sight of the solid world below is completely cut off by an ocean of boiling clouds.

Sometimes the upper surface of a vast curtain of clouds which entirely conceals the earth is cast up into immense mountainous masses, as if it were a world of snow. I have seen a photograph of such a scene made from a balloon, which showed a huge white round-topped mass, in form not unlike the mighty dome of Chimborazo rising from an almost level plat nof clouds, which stretched thousands of feet below the balloon and extended to the horizon on all sides.

The resemblance to a real landscape, variegated with hills and mountains and covered with eternal snow, is heightened when a thunderstorm happens to be raging in the clouds beneath the aeronaut's feet. The lightning flashes vividly from peak to peak and across the chasms of air the thunder cracks sharply in the startled ears.

Occasionally a descent has to be made through such a curtain of cloud, and it is not without its special danger, both from electric discharges and from the effects of the moisture, and of the sudden cooling on thebuoyancy of the balloon.

When the lower world is cut off by clouds the aeronaut, of course, can only estimate his position, and having no landmarks to go by, and no certain means of measuring his speed or the direction of his flight, he is in the truest sense lost in the midst of the sky. At night he may get his general direction from the stars, but any precise observation is impossible.

The effect of swiftly dropping through the lower side of a layer of clouds, and seeing the earth beneath apparently in the act of bounding up to meet the descending balloon, is described by those who have experienced it as startling in the highest degree.

The balloonist has opportunities for cloud study of the most excellent kind. He sees them from a new point of view, and can observe many peculiarities not visible from the ground. The great differences in the elevations of clouds of various kinds are brought clearly to his attention.

An ordinary stratus cloud, covering the whole heavens as seen from a fixed point on the earth, has usually an elevation of less than half a mile, or say from 2000 to 2500 feet. The balloon on rising rapidly enters the lower surface of the cloud and in a few minutes emerges from the upper surface into an aerial world of sunshine. Yet above may appear another, less compact, layer of strato-cumulus, like a roof, with cloudy rafters, and this may or may not be reached, according to the elevation which the balloonist undertakes to attain.

There may be a space of air a mile or more in thickness between the lower clouds and the upper ones. If the balloon ascends through the second roof a third may come into view above, composed of alto-stratus, which ordinarily floats at an elevation of three and a half miles. Even this may be penetrated by a very bold adventurer in the sky, and then it would be possible for a fourth cloud-roof to be seen above, at an elevation from six to ten miles from the earth, consisting of the lightest and most beautiful of all clouds, the cirri.

These, disposed in flaky masses, or long, curling filaments, often gleam with the colors of a surface of mother of pearl. But only unmanned balloons can rise to the region where the highest cirri are formed.

Of course, the succession of clouds just described would not be likely to be encountered on any particular balloon trip, and yet it might be. But if only two or three layers of cloud are penetrated the ordinary sensation of rising through an aerial world divided into successive stories is experienced.

The highest clouds do not form vast, unbroken layers, like some of those nearer the earth. There is no other kind of cloud so imposing as the cumulo-nimbus.

It piles itself up in vast mountain-like masses, with snowy cliffs, precipices and projecting bluffs and brows, and seems, when viewed from the ground, gleaming in the sunshine, to penetrate the highest heavens. Its majestic peaks do, sometimes, attain a height of from six to eight miles, but its bases can be reached by a balloon, though the balloonist would avoid its neighborhood, for it is the typipcal thundercloud.

Captive Aviator Drops German Officer Out of Plane In French Lines

Havre, France, May 13.—A young British aviator was recently decorated in front of the troops for a flight accomplished in company with a German officer.

The aviator had been obliged to descend within the German lines, and was made a prisoner by a German officer into whose hands he had fallen. The latter conceived the idea of making his prisoner take him in his airplane for a flight above the allied lines in order to make observations, which would not be disturbed by anti-aircraft fire, as the enemy would be misled by the cockade on the biplane.

The German officer reinforced his order with a revolver, and the aviator accordingly resumed his seat in the machine and strapped himself in securely.

The German officer, with his pistol in his hand, took the observer's seat, and the couple then flew towards the allied lines, the aviator making a number of evolutions to the right and left, according to the orders of the German. Having seen sufficient the officer of the kaiser ordered the aviator to turn his machine and in order to do so the airplane mounted higher, and suddenly turned over in an admirable loop.

On righting himself the pilot found that he was alone, the German officer having for once been insufficiently strapped in.

The aviator descended as quickly as possible into the British lines, where he received a welcome which took the form of a decoration.

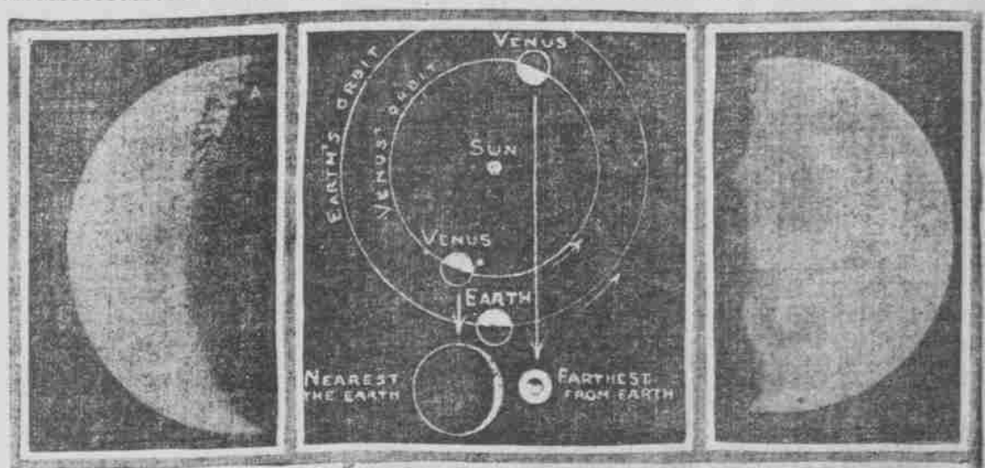
Sweden and Russia Near Breaking Point

Stockholm, Sweden, May 13.—The relations between Sweden and Russia remain strained in spite of the official assurances of friendship exchanged by the governments of the two countries. In the last four or five weeks several hundred Swedish citizens have been expelled from Russia under various pretexts. Others have been arrested and thrown into prison as alleged German spies.

The action of the Russian authorities is bitterly resented here and the Swedish government has instructed its minister at Petrograd to make a sharp protest.

Venus, the Shining Jewel of the Sky

It Appears Now of Great Brilliancy as It Nears the Earth.



Venus through the telescope. The diagrams show why we can see only its dark side when the planet is nearest to earth. The letter "A" shows the 40-mile high Alps, which project above the cloud canopy.

By GARRETT P. SERVISS.

IF Venus is aware of the attention she is attracting, of the admiring remarks she calls forth, and of the perplexity she is causing to some people who wonder who and what she is, she ought to blush as red as her ardent brother, Mars. Everybody is asking about her, as if she were a stranger suddenly entering a ballroom unannounced, unattended, and fixing every eye with her beaming beauty.

A few definite facts about this fascinating celestial personage would evidently be welcomed by the large number of writers of letters about her that have recently been received.

The first fact to be noted is that "the bright star, without a rival, which shines in the west early in the evening," is no star at all, but is the planet Venus. She retires early and should be looked for before 9—best about 8. As one writer has remarked, she wears an aureole when the sky is misty. When the sky is clear it would be difficult to imagine anything more radiantly beautiful than her appearance. But she will grow more brilliant still until near the end of May, when she will be one-third brighter than she is at present.

Just now about one-half of her disk, as seen from the earth, is illuminated by the sun, so that if you look at her with a telescope she will be seen in the form of the moon when it is at first or last quarter. She will draw nearer to the earth until the beginning of July, when she will pass between the earth and the sun, and then reappear in the morning sky.

During May and early June she will appear in a telescope in the form of a beautiful crescent, gradually getting thinner and more delicate as she draws nearer the sun.

She has been making this circuit regularly ever since the human race began, and yet she always comes back into the evening sky with the same surprising effect.

Once in every 584 days she reappears in the character of "evening star," and every time people imagine she is something new. The ancient Chaldeans, the Egyptians, the Greeks, the Romans, all watched her as we do today, and no doubt She found them as forgetful at each return as she finds most of us now.

Venus is a world practically of the same size as this one on which we dwell. If the earth were substituted in her place it would look just about the same as she looks. She is 7700 miles in diameter, and the earth is a little over 7900. But she is 26,000,000 miles nearer the sun, and gets twice as much light as we get. That means twice as much heat, too, and the summer temperature on Venus—unless her atmosphere is different from ours—must be terrific.

But an atmosphere by variations in density and composition, can work magic in such things, as is shown by the marvellously different state of affairs that prevailed on this globe in the Carbaniferous Age, and when temperate and perhaps even tropical climates existed around the polar circles.

As we see her now, Venus is about 115,000,000 miles away, but on the 3d of July will be only about 27,000,000 miles from the earth. At that time, if she did not turn her back to us, she would appear nearly 20 times as large and bright as she does at present, and, with powerful telescopes, we might be able to discover signs of her inhabitants, if she has any.

But, unluckily, when she is between the sun and the earth that side of her which is presented to us is in total darkness. The nearer she gets the closer the veil is drawn over her face, and it is shut completely at the moment of nearest approach.

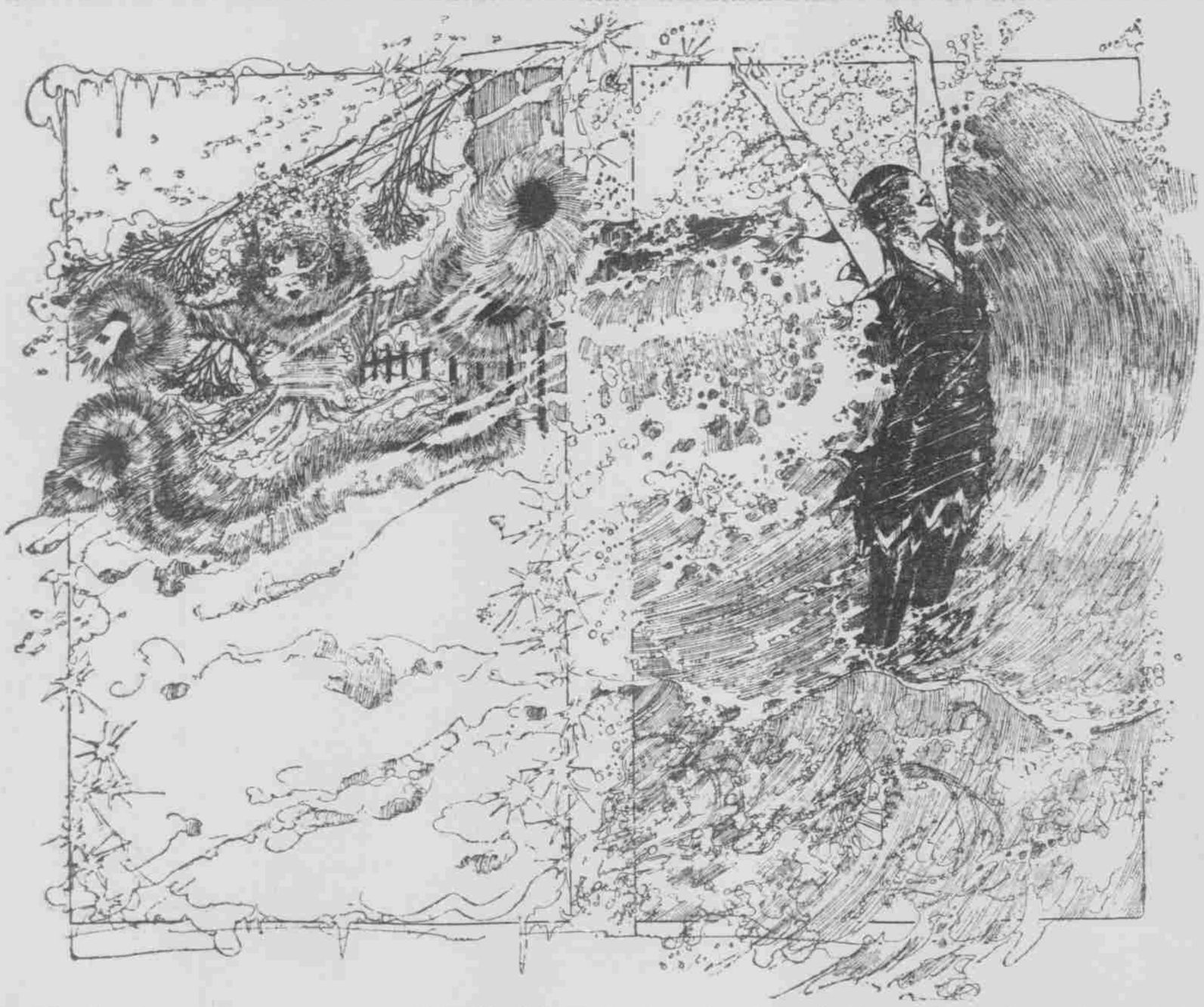
While looking at her as she glows in the sunset sky it is interesting to recall a peculiar predicament into which she seems to have fallen. The sun has so far mastered her with his tidal attraction that she has almost ceased to rotate on her axis. She turns just fast enough to keep one side of her globe always toward the sun.

She knows neither sunrise nor sunset; she has a night side and a day side, that is all. If the conditions of her surface and her atmosphere are such that life can exist both in her perpetual daylight and her perpetual night, then half of her inhabitants see only the sun in the sky while the other half see only the stars.

But the latter see the earth among the stars, at the time of the nearest aproach of the two planets, shining in mid-heaven with amazing splendor, incomparably more brilliant than any planet ever appears to us. If they are superstitious, they probably worship the earth, with its moon circling it like an acolyte, but if they have telescopes they make maps of it and speculate about its inhabitants.

Between Sports — WADING — As We Had to And as We Will

By NELL BRINKLEY



LONG ago—oh, a few weeks or so—we women folk were whipping around corners in a gale, with our nose pink and our finger tips numb. And we wore comforts of fur and worried about the apple blossoms in our too precocious spring bonnet. No wading now of any kind——we walk abroad and twiddle our thumbs and are bewildered—but we dream of wading to come—heavy green sea-water—with the foam like the sleet to beat the blood into our cheeks—no sleeves, no fur, no spring bonnet to worry about, but a free body and a warm skin in the sun. We are just at the uncomfortable, awkward space that lies between sports.

—NELL BRINKLEY.

Every Woman Should Read This Article.

The Girl Who Drinks

A Habit Easily Avoided, Yet One That Invariably Leads To Disgrace.

BY BEATRICE FAIRFAX.

WE all remember Benjamin Franklin's little tale which ended "for want of a nail the shoe was lost, for want of a shoe the horse was lost, for want of a horse the rider was lost," and the philosophy of that applies all through life to every first little false step, however trifling.

So it is with the subject I am considering today—a subject suggested by a very interesting letter given here in part:

"I am an interested third party in a discussion going on between two very dear friends of mine. A, who is 20, and B, who is 18, both went to a house party where they served wine and cocktails. A refused absolutely to touch a drop, while B at first refused but after much persuasion drank one glass of wine and one cocktail.

"When they met the next day, A upbraided B for drinking, while B defended herself by saying that she only did it for fear of offending her hostess and of making herself conspicuous as A did, for A was the only one of all present who refused. B further went on to say that she would never dream of doing it at any public place, but seeing that they were all friends at a friend's home she saw no harm in it. A, however, insisted that B had done an unwise thing and would not be convinced otherwise.

"The next day B, who is a charming girl and liked by everybody, came to me and asked my advice. She has been invited to a birthday party by one of the girls present that day and as the party is in two weeks she is at a loss to know what to do. She is afraid that should she refuse to touch anything they may serve, her future hostess may feel offended at her refusal in her home, whereas she accepted in the other girl's home. She confided to me that that was the first time she had ever tasted wine and that she hated the taste of it."

"A" took the sane and dignified stand and I applauded her bravery. The girl who does not yield to persuasion" is a splendid woman.

There is nothing particularly degrading in drinking one glass of wine and one cocktail in a private home, but it is the first step toward a very dangerous situation. Since "B" drank at the home of a friend she is likely seriously to offend another hostess by insisting on taking a temperance attitude at a party in her home. But she had better risk that offense—instead of her own future!

Supopse she takes step number two: here is a little picture—not at all exaggerated of the other steps that must follow:

The Inevitable Steps.

In order to avoid hurting the feelings of other good friends, she must take a drink or two at their house parties, and then one of the group entertains in a restaurant and she is told that she certainly is not "a good fellow" unless she joins in and has a little glass there.

Then the men who are in the habit of seeing her drink when she is one of a group, insist that it is a personal affront if she refuses to trust them enough to take a drink when out alone with them and pretty soon "B" finds herself expected to do a "little drinking" whenever she goes out for a social evening. And each step is such a tiny one—and follows so inevitably on the one before!

The least that can happen is that she is judged by people who see her taking liquor in public places to be a rather rowdy and ordinary young woman.

But a far greater danger waits her than unfavorable public opinio—she is all too certain to learn to like liquor. And although the word drunkenness is hideously abhorrent and seems very, very far away from the girl who takes a drink or two in a friend's home—drunkenness lies ahead.

If a girl has made the blunder of taking a drink or two in the home of one friend she can easily rectify it. At the next party to which she goes she can quietly say: "I made a mistake by taking anything to drink the other night. Please don't urge me to drink tonight for I am determined not to and an argument won't make any of us happier. I just don't like liquor—that's all."

Don't Give in to It.

No preaching, no "holier than thou" attitude is necessary—just a definite stand on a subject on the ground that it is a matter of personal taste.

No hostess insists on your eating lobster if it is repellant to you. No hostess has a right to force her guests to drink if they quietly remark that they don't like liquor.

For any 18 or 20 year old girl to form the drink habit is hideously and criminally dengerous.

Feminine vanity ought to lend itself to the natural stand of dignity. The woman who drinks generally looks frowzy and heavy-eyed, and her mental state is reflected in her appearance.

Mental inefficiency, moral laxity on the enthical side—and on the social side bad reputation, loud-voiced rowdiness, and coarsened appearance! What girl wants to yield to the plea to "be a good fellow" and take a drink or two when the price she will have to pay is so clearly, inevitably indicated?

Although he has no hands, Luther Cranford, of West Fairview, Pa., is able to write a fine style of penmanship and shorthand, run a typewriter, shoot pool or do anything that a man with a full complement of fingers can do.